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## FALCON tested on Edwards Test Stand 2A

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EDWARDS AIR FORCE BASE, Calif. — Supporting a Defense Advanced Research Projects Agency (DARPA) and the Air Force Small Launch Vehicle (SLV) program called 'FALCON', Air Force Research Laboratory Propulsion Directorate personnel will begin conducting hybrid rocket testing at the Edwards Research Site this month.

The testing is part of FALCON's ten-month long Phase II effort to develop and demonstrate an affordable and responsive space lift capability. The program goal is to develop a low-cost, responsive launcher capable of placing a small satellite, weighing 1,000 pounds, into a circular 100 nautical mile orbit.

The laboratory's recently renovated Test Stand 2A, rededicated on Jan 14, 2004, will initially be used to conduct hybrid rocket horizontal tests with 20,000 pounds of thrust. The family of rockets being proposed can be as large as 250,000 pounds of thrust. A hybrid rocket's propellants typically consist of a rubber-like solid fuel 'grain' and a liquid oxidizer. The designation 'hybrid' refers to this blend of solid and liquid rocket technologies.

The hybrid rocket is to be designed and built for Lockheed Martin Corporation by their Space Systems Company at Michoud Operations, located near New Orleans, La. The contract award to Lockheed Martin by DARPA was announced on Sept. 15, 2004.

Large hybrid rockets were last fired at AFRL in the late 1980's when the American Rocket Company (AMROC) performed testing at Edwards under the Commercial Space Act. Hybrid propulsion was also recently used by SpaceDev for propelling the SpaceShipOne rocket.

Helping to assure that AFRL's Edwards Research Site was the most modern and capable rocket research and test facility in the nation, efforts by the California Space Authority (CSA) helped identify space infrastructure needs and gained support for the refurbishment of numerous rocket test stands and facilities at the site. CSA's support was instrumental in getting Test Stand 2A up and operating again over the last three years.

Test Stand 2A is the Department of Defense's most capable rocket component development facility, capable of performing developmental testing on the largest rocket engines under development today. In the 1960's, Test Stand 2A was important in resolving the combustion instability problems that plagued the development of the Apollo Program's main booster engine. Demonstrating its testing flexibility, AFRL is putting the finishing touches on the refurbished Test Stand 2A. The DARPA FALCON program funded facility improvements during Fiscal Year 2004, customizing fixtures and propellant plumbing for the FALCON tests.

Nearly every American launch vehicle, missile, booster, or space propulsion system used today derives its technology and testing validation from research and test efforts at the AFRL's Edwards Research Site.

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